

CLAIMS

1. A computer-implemented method for updating databases that store blockchain data, the method comprising:
 - identifying, based on a transaction associated with a blockchain network, an account identifier (ID) of a blockchain account involved in the transaction, wherein the transaction is included in a current block to be appended to a blockchain associated with the blockchain network based on performing a consensus algorithm;
 - updating, in a current state object database, an account state corresponding to the account ID of the blockchain account to an updated account state based on the blockchain transaction after the current block is appended to the blockchain;
 - hashing the updated account state to generate a hash value of the updated account state;
 - identifying, in a current state database, the hash value of the account state corresponding to the blockchain account based on the account ID of the blockchain account;
 - and
 - updating, in the current state database, the hash value of the account state to the hash value of the updated account state.
2. The method of claim 1, wherein the current state object database stores, for each blockchain account of the blockchain network, a mapping between an account ID and an account state of the corresponding blockchain account.
3. The method of claim 1, wherein the consensus algorithm is based on one of proof of work (PoW), proof of stake (PoS), and practical Byzantine fault tolerance (PBFT).
4. The method of any previous claim, wherein the current state database stores hash values of account states of corresponding blockchain accounts in a state tree, and wherein account IDs and corresponding hash values of the account states are stored as key-value pairs.
5. The method of claim 4, wherein the state tree is a location-addressed state tree.

6. The method of claim 5, wherein the location-addressed state tree is a current state tree of a fixed-depth Merkle tree (FDMT) or a bucket tree.
7. The method of claim 4, wherein the account ID identifies a relative location of a branch node or a leaf node at a corresponding layer of the state tree for locating the hash value of the account state.
8. The method of claim 7, wherein the hash value of the account state corresponding to the blockchain account is a first hash value, the leaf node stores a plurality of hash values of account states associated with a plurality of blockchain accounts, and the account ID further identifies a relative location of the first hash value among the hash values stored in the leaf node.
9. The method of any previous claim, wherein the consensus algorithm is performed after one or more of existence, validity, and authenticity of the transaction are verified.
10. A computer-implemented system for updating databases that store blockchain data, comprising:
 - one or more processors; and
 - one or more computer-readable memories coupled to the one or more processors and having instructions stored thereon that are executable by the one or more processors to perform the method of any of claims 1 to 9.
11. An apparatus for updating databases that store blockchain data, the apparatus comprising a plurality of modules for performing the method of any of claims 1 to 9.